

DEC 29 2006

PATENT APPLN. NO. 10/743,745  
RESPONSE UNDER 37 C.F.R. §1.111

PATENT  
NON-FINAL

REMARKS

Claims 1, 3, 5, 7, 13, 15, 17 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kohno et al. (U.S. Patent No. 6,130,006) (hereinafter: "Kohno"). The alloy of Example 137 in Table 16 of Kohno is cited by the Office as satisfying the compositional formula of the hydrogen absorbing alloy of the rejected claims.

This rejection is not proper. The hydrogen absorbing alloy of Example 137 is not within the scope of the hydrogen absorbing alloy claimed in the present application. In the formula of the hydrogen absorbing alloy claimed in the present application, the mole ratio "(1-x)" of rare earth element(s) must be greater than 0.80, i.e.,  $0.05 \leq x < 0.20$ . Moreover, the hydrogen absorbing alloy claimed in the present application does not contain Ca or Ti. In the general formula for the hydrogen absorbing alloy of Kohno, "a", which represents the mole ratio of rare earth, cannot be greater than 0.80.

Claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Kono et al. (JP 2000-265229) (identified by the Office and referred to herein as "Ryuko"). The Office identifies the alloys of "Example 1" in Table 1 and "Example 7" in Table 2 of Ryuko as satisfying the

compositional formula of the hydrogen absorbing alloy of the rejected claims.

Initially, applicants note that the hydrogen absorbing alloy of "Example 7" in Table 2 of Ryuko is not within the scope of the hydrogen absorbing alloy claimed in the present application. The mole ratio of rare earth does not satisfy the compositional formula of the hydrogen absorbing alloy of the rejected claims.

The claims have been amended to exclude the alloy of "Example 1" of Ryuko from the scope of the claims. The claims now limit La, when included as a rare earth, to a mole ratio of not greater than 0.5. This limitation is supported by the examples in the present specification. In the examples, La does not exceed 0.5 (mole ratio).

Removal of the 35 U.S.C. § 102 rejections is in order and is respectfully solicited.

***Claim Rejections - 35 USC § 103***

Claims 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryuko. The position of the Office appears to be that alloys within the scope of the hydrogen absorbing alloy claimed in the present invention are *prima facie* obvious because it "would have been obvious to one of ordinary skill in the art to select the desired

amounts of each the claimed elements from the amounts disclosed by Ryuko because Ryuko teaches the same utility throughout the claimed ranges." (Action, page 4, lines 2-4).

Applicants respectfully submit that to the extent, if any, Ryuko supports a case of *prima facie* obviousness of the claims of the present application, such obviousness is rebutted by the unexpected properties of the alkaline storage battery of the present invention demonstrated by the comparative data in the present application.

The present invention improves the cycle life of an alkaline storage battery without a reduction in capacity of the hydrogen absorbing alloy by addition of Al to a rare earth-Ni series hydrogen absorbing alloy containing Mg.

In the present invention, the mole ratio of Al ("a") in the hydrogen absorbing alloy is in a range of 0.10 - 0.25. As described in paragraph [0013] of the present specification, if "a" is less than 0.10, the hydrogen absorbing alloy is easily oxidized by the alkaline electrolyte and the alkaline electrolyte is consumed and reduces the cycle life of the battery because of a shortage of the electrolyte. However, if "a" is greater than 0.25, the capacity of the hydrogen absorbing alloy is reduced and the advantage, i.e., high capacity, of the alloy is lost. As a result,

an improvement in cycle life cannot be expected because the capacity ratio of the negative and positive electrodes (capacity of the negative electrode/capacity of the positive electrode) is reduced.

As shown in Tables 1 and 2, a content of Al, where "a" = 0.05, 0.10, 0.20, 0.25, 0.30 and 0.40, was studied, and when Al was in the range of 0.10 - 0.25, good (unexpected) results for the cycle life and initial discharge capacity of the alkaline storage battery were obtained.

In general formula (1) of Ryuko, Al is identified as M1, and the content of M1, "z", is 0 - 0.2. Table 1 shows the results of experiments using the alloys of general formula (1). Examples 1, 4 and 6 include Al, but the content of Al in each example is not greater than 0.03. Ryuko does not disclose or suggest the improved properties of an alkaline storage battery where the content of Al is within the range of 0.10 - 0.25.

In general formula (2) of Ryuko, the content of Al, "x", is greater than 0.2 and not greater than 0.7. Table 2 of Ryuko shows examples of the general formula (2). In Examples 14-18, the content of Al is 0.3 or greater which is outside the limitation of the claims of the present application. In paragraph [0045] of Ryuko there is a description that the content of Al of greater than

0.2 and not greater than 0.7 is preferable from standpoints of characteristics of occluding and releasing hydrogen, corrosion resistance to an alkaline solution, effective discharge characteristics and cycle life.

As explained above, in the present application the contents of Al, "a", of 0.05, 0.10, 0.20, 0.25, 0.30 and 0.40, were studied, and when "a" was in the range of 0.10 - 0.25, unexpectedly good cycle life and capacity were obtained. The data show that a content of Al of not less than 0.3, which is the range studied by Ryuko, is not suitable since maximum capacity is reduced.

In general formula (3) of Ryuko the content of Mg of 0.2 - 0.35 is different from that of the present invention, i.e.,  $0.05 \leq x < 0.20$ .

For the above reasons, the claims of the present application are patentable over Ryuko under 35 U.S.C. § 103(a) and removal of the 35 U.S.C. § 103(a) rejection is respectfully requested.

#### ***Double Patenting***

Claims 1, 3, 5, 13, 15 and 17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 3 of copending Application No. 11/356,448 and over claim 2 of copending Application No. 11/348,261. Claims 1 and 5 are provisionally rejected on the

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ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 9 of copending Application No. 11/169,901; over claims 13-14 of copending Application No. 11/041,678 and over claim 2 of copending Application No. 10/787,593. Claims 1, 5, 13 and 17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/758,541.

Applicants respectfully submit that no response to the provisional double patenting grounds of rejection is required until there is a determination of allowable subject matter in the present application.

The foregoing is believed to be a complete and proper response to the Office Action dated August 30, 2006, and is believed to place this application in condition for allowance. If, however, minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 111833.

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In the event any additional fees are required, please also  
charge our Deposit Account No. 111833.

Respectfully submitted,

KUBOVCIK & KUBOVCIK



Ronald J. Kubovcik  
Reg. No. 25,401

Atty. Case No. SNY-048  
The Farragut Building  
Suite 710  
900 17th Street, N.W.  
Washington, D.C. 20006  
Tel: (202) 887-9023  
Fax: (202) 887-9093  
RJK/ff